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June 12, 2007

Winston Hickox, Chair
California Environmental Protection Agency
AB32 Market Advisory Committee (MAC)
California Air Resources Board
1001 I Street, 15th Floor
Sacramento, CA 95818
Via e-mail: climatechange@calepa.ca.gov

Comments on Market Advisory Report

Dear Mr. Hickox,

This letter and its attachment provide comments on the June 1, 2007 draft report titled "Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California" which has been prepared by the Market Advisory Committee to the California Air Resources Board.

These comments are offered by CantorCO2e on behalf itself and clients that are subject to the requirements of the California Global Warming Solutions Act (AB 32). These clients own sources that have operated in California for periods of time ranging from over a hundred years to those that are contemplating establishing operations in the state. Some own facilities throughout the state. Others have technologies that promise to extract greenhouse gas emissions in new and cost effective ways. These clients are all joined by one common objective – that California adopt a program that focuses on achieving cost effective, certain, and expeditious greenhouse gas reductions in a fashion that is consistent with the requirements of AB 32.

CantorCO2e is the world's oldest emissions trading brokerage firm. Established in 1992 by Cantor Fitzgerald, we have played key roles in the development, implementation, and refinement of nearly every important emissions trading program in the world. In addition to providing consulting and brokerage services to our clients our staff have served or chaired a number of emissions trading related groups including the **California Climate Change Advisory Committee** (appointed by the California Energy Commission), the **RECLAIM Three Year Audit Committee** (appointed by the South Coast Air Quality Management District), the European **Trading and Market Liquidity Group,** the **Emissions Trading Group (**a think-tank that was instrumental in shaping the European Emissions trading), the **Voluntary Carbon Standard** (an international body drawn up under the Climate Group), and the **International Emissions Trading Association**

Based on the experience gained through 25 years in serving these markets and the direction of our clients we offer the following brief recommendations regarding the critical elements that should be included in a CARB implemented AB 32 market. And we offer specific comments regarding one element of the report – that dealing with the preferred means of distributing allowances.

Critical Elements of an Emissions Trading Program

While the focus of this letter is on one aspect of the report – the distribution of allowances – we believe that the critical elements of an effective emissions trading program merit at least brief mention:

1. The goals of an emissions trading program must be clearly stated.

2. Sectors that contribute to the pollution problem should be included in the emissions trading program proportional to their contribution to the problem.

3. An effective program must be based on an emissions inventory that accurately represents all significant emissions sources.

4. A comprehensive permit system should be in place.

5. There should be a credible enforcement threat.

6. An emissions program should be efficiently and effectively administered with clear and unchanging rules, consistent decisions, and adherence to timeliness and schedules prescribed in the regulations.

7. An effective emissions banking process should be included.

8. The program should be self-supporting.

9. The administration of both the air quality rules and the emissions trading program should be under the control of a single regulatory entity.

10. Allowance allocations should be fair and consistent with the program goals.

11. The mechanics of trading the commodity need to be clearly defined and carefully structured.

12. After the market is launched regulators must resist the urge to meddle with the market.

13. The program should be designed to facilitate integration with other cap and trade programs.

14. Allowances should be allocated, not auctioned.

Auctions vs Allocations

To address this last point, the report heavily favors the use of auctions. In its purest form, under an auction, over time, only sources that buy allowances (or successfully plead for some sort of special consideration) are afforded the ability to emit greenhouse gases. This mandate applies to both new and existing sources.

Under a simple free allocation system, sources that are in operation at the commencement of the program are provided some sort of allocation that allows them continue to operate. New sources are either given a special allocation (which may be set aside from the initial allocation) or allowed to buy surplus allowances from existing sellers.

Section 6.1 (and the subsection conclusions in Section 8) offer a plethora of reasons as to why auctions are preferred over the free allocation of allowances to emitting sources. A contrary opinion, together with the supporting logic are summarized below (and in the attached excerpt of Section 6.1 of the document).

1. Historically, successful emissions trading programs have relied upon allowance distribution systems where a source is offered a declining emission checkbook without cost to the source for the initial allocation. We are unaware of any successful pure auction system (though the EPA's acid rain program initially employed a periodic auction process) where existing and new sources secure their initial and ongoing allowances through an auction.

2. The free distribution allocation method puts tons into circulation, and rewards sources that discover they can benefit economically by reducing their allowance needs and selling their surplus. In contrast, an auction is another form of a carbon tax, one that delivers revenues to the government without the obligation to make prudent decisions regarding the use of such monies.

3. An allocation system gives sources their allocations well into the future (in some cases, indefinitely). In contrast, an auction forces participants to purchase near and long term allowances, begging the question as to how sources will recover these costs (of course, the ultimate bill is delivered to the customer who purchases the products).

4. Market liquidity and diversity, will be relatively higher under a free allocation system and lower under an auction system. Giving thirty years worth of allowances to covered sources will ensure that sources have a base amount of allowances which the can either use or sell. The availability of these allowances, especially at the outset of this program, allows sources to purchase on the spot market as well as execute puts, calls, leases, swaps, forward transactions for near term as well as future year allowances, all with variable terms and conditions and counter party credit quality. A government sponsored auction cannot hope to mimic or outperform a free allocation. Withholding such allowances, and making them only available through government sponsored auctions will have an opposite impact on liquidity.

5. An allocation system allows for the healthy participation of both sources and speculators. Giving sources allocations at the outset gives them a base amount which can be relied upon by sources at the outset of the program and throughout is phases. In contrast, distributing allowances through an auction mechanism gives speculators, especially those with deep pockets, the opportunity to shut less well funded naturals out of the market. In this fashion, speculators can exercise market power that would be denied them under an allocation scheme.

6. An auction severely disadvantages existing emitters over new sources with sunk costs and stranded assets. In an auction new entrants have the choice of tailoring their purchases and facility designs in perfect synchronization. Existing polluters have plant designed for an environment where polluting is free, and new entrants design their plant for the new environment, so auction discriminates against existing polluters who have a higher cost-base.

7. An auction drains cash from emitters, resulting in less available capital to invest in reducing emissions. Expecting companies to invest to reduce emissions, at the same time as paying out cash for allowances in an auction, creates a cash-crunch. The result is a reduction in investment in reducing emissions.

8. An allocation gives sources the resources necessary to generate cash in the event that the holding source has found a way to reduce its greenhouse gas emissions. Invest in a pollution solution, use fewer allowances, and sell the surplus allowances to recoup the investment in pollution controls. In contrast, an auction simply puts sources in a cost minimization mode (they do what's necessary to acquire the least amount of allowances at the outset) rather than a profit maximization mode ('over-compliance' can free up allowances that can be sold) that comes with a free allocation.

9. Under an allocation system, the market (rather than the state) chooses the winners. Those who can adjust their operations in a fashion that results in fewer emissions and those who elect to purchase allowances determine which solutions advance. This is preferable to the situation where a team of bureaucrats have the discretion to invest or otherwise spend money earned from an auction. A situation where there is no guarantee that the monies raised through an auction will be wisely invested to produce cost effective greenhouse gas reductions, or for that matter, not diverted to pay for some other state priority (i.e. highways, schools, prisons, etc.).

Finally, we thought it worth commenting on a number of instances where the European experience of 'windfall profits' in the EU Emissions Trading Scheme (EU ETS), is quoted as an illustration of why free-allocation should be avoided. This is a misunderstanding of the situation in Europe, and we deem it sufficiently important for separate comment. Please note also that our comments are based on having been intimately involved in the design of the EU ETS through a number of boards and government committees, the experience of being one of the principal centres of liquidity in the European market, and the synopsis of many analyst reports, some published and some not, into the EU ETS and electricity pricing.

In Europe, there was a small amount of over-allocation to particular industrial sectors in a small number of Member States, particularly in Eastern Europe. This was because some individual Member States were playing a game of using the EU ETS as a way of providing indirect subsidies to local industry, to better enable them to compete with industry in other Member States. The European Commission caught most of these and slashed their allocations, but some slipped through.

Windfall profits from over-allocation were not material however. The material windfall profits were made in the electricity industry - the industrial sector which was universally under-allocated right across Europe. Why was this? Many analysts say it was a demonstration of oligarchic market power in the European electricity industry, and a failure of electricity regulation. On average, European electricity generators received free allocations amounting to around 85% of their needs and had to buy the remaining 15% on the market. What they then did, was raise all of their electricity prices by 100% of the marginal purchase cost of the allowances acquired – i.e. more than

six times the average cost of the allowances actually employed. So they used emissions trading as an excuse to increase prices by more than costs, and thus secure windfall profits.

How were they able to do this? Many observers say that this occurrence is the clearest demonstration in a number of years that competition in the European electricity sector is not as fierce as the generators would have you believe. Thus windfall profits in the electricity sector are an issue for electricity regulation, not emissions trading. It is important to note that the ability to increase prices by more than costs is a function of regulation and competition, and independent of whether allowances are auctioned or allocated.

As noted earlier, our edits to Section 6.1 are incorporated into the attached document. Our comments are highlighted in blue. Thank you for the opportunity to provide you with these comments. CantorCO2e looks forward to receiving your feedback on this letter and to participating in future discussions with the board, its members, and staff. Please do not hesitate to call us at 4152-296-9359.

Respectfully,

CANTORCO2e

Josh Margolis
co CEO

Attachment

6 Other Design Issues

6.1 Allowance Distribution

6.1.1 General Principles

Allowances have an economic value; therefore, how California decides to distribute them will have an economic impact on regulated entities, consumers, and other parties.

However, it is critical to understand that these decisions will not have an impact on the environmental result of the cap-and-trade program. The initial distribution of allowances clearly affects the distribution of costs for meeting California's emission reduction targets. Under certain circumstances, it affects the overall costs. But under no circumstances does allowance distribution affect the achievement of the targets themselves. This, unfortunately, is not true. The system of distribution has a very great effect on both the sources covered by the program, their ability to make and recover investments, and the resulting environmental benefits. Here is why:

- Under a free allocation system, those who hold the allowances are incented to figure out ways in which they can emit less in order to sell surplus allowances. An emitting company can over comply by investing to reduce emissions, knowing that this investment can be immediately offset by sales of surplus allowances. If allocations are made for several years at one time, the emitter can potentially receive cash payment today to fund a substantial portion of his capital costs. If the company is given a forward allocation (i.e. for current AND future years) the company can sell forward at a known price, and fix a forward revenue stream and earn a return on his investment. By over-complying (i.e. emitting fewer tons than allowed and something that routinely occurs under the EPA SO2 and NOx allocation based cap and trade program) sources can both save money (by emitting less and consuming fewer allowances), and also make money by selling surplus allowances.

- Under an auction system sources are not similarly incented and have fewer resources to invest in clean air solutions. Sources will buy only as much as they need. As such, they will likely buy just enough allowances and have fewer resources available to invest to reduce emissions, since not only will it not receive an income from its investment (just an avoided cost), but it will actually have to pay cash out to the regulator at the same time as it is expected to pay for capital investment-creating a double drain on financial resources. Their only incentive is to figure out how they can avoid costs. They will NOT have an ability to make money by selling surplus allowances (unless they buy too much in an earlier auction). What is worse, in a system of annual auctions, the company will be trying to invest without even knowing the forward cost of its avoided emissions. For companies with limited financial resources therefore (i.e. all of them), auction systems tend to encourage a lower level of investment in environmental reductions, compared with systems of free-allocation. Further, under an auction scheme, the government is left with the obligation to figure out how to spend the collected tax revenues. And the environmental benefit is determined by well-meaning bureaucrats.

The difference an allocation vs an auction system has on the environment is clear. Under an allocation system sources seeking to make money will over comply, emit less, sell their surplus

allowances, and use generated monies to help finance alternative low emitting activities. In contrast, under an auction system, sources are encouraged to count their pennies, conserve their funds, and figure out how to minimize the expenditure of resources.

California should strive to distribute allowances in a manner consistent with fundamental objectives of cost-effectiveness, fairness, and simplicity. As discussed below, these objectives favor a system in which California ultimately auctions all of its emissions allowances. Furthermore, the committee favors a system whereby the majority of sources will, over time, be forced to buy each and every allowance. However, several factors weigh in favor of distributing some allowances for free at the outset of the program and transitioning to a full auction over time.

The Committee strongly recommends that California distribute allowances in a manner that advances the following principles:

• reduces the cost of the program to consumers, especially low-income consumers No. There should be a feedback loop that rewards and penalizes consumers for purchasing products based on the carbon impact of the product or service. Insulating consumers from the effect of these choices eliminates their ability to make carbon consequential decisions.

• avoids windfall profits where such profits could occur The possibility of windfall profits can be avoided (1) by ensuring that allocations are distributed in a fashion that starts sources short and (2) through legislative solutions that narrowly prescribe how allowance costs can be recovered from rate payers. Public policy makers should be keenly interested in ensuring that profit windfalls *CAN* be secured by inventors, entrepreneurs, and gutsy sources who figure out a way to reduce their GHG emissions in such a way that allows them to over-comply make profits, even windfall profits, by selling their unneeded surplus allowances.

• promotes investment in low-GHG technologies and fuels (including energy efficiency) Better not to auction then, as auctioning takes capital that could have been spent on low emission technologies and gives it to the regulator – as discussed above

• advances the state's broader environmental goals by ensuring that environmental benefits accrue to overburdened communities As discussed above, an auction does *NOT* promote over-compliance thus limits the environmental benefit. Also, global warming is not a localized problem, and the environmental benefits will accrue to overburdened communities without an auction.

• mitigates economic dislocation caused by competition from firms in uncapped jurisdictions

• avoids perverse incentives that discourage or penalize investments in low- GHG technologies and fuels (including energy efficiency) Under an auction system, sources are, not surprisingly, incented to buy just enough allowances to maintain compliance.

• provides transition assistance to displaced workers

• helps to ensure market liquidity – Market liquidity, and diversity, will be relatively higher under a free allocation system and lower under an auction system.

- Want to ensure that allowances are available? Then give them away to sources at the commencement of the program. Want to limit their availability? Then offer them out under government sponsored and designed auctions.

- Want to encourage sources to over comply and relinquish allowances? Then give them the allowances and allow them to sell their surplus? Want to remove incentives for over compliance, then parse them out through limited periodic auctions.

- Want to ensure that sources have an ability to purchase on the spot market as well as execute puts, calls, leases, swaps, forward transactions for near term as well as future year allowances, all with variable terms and conditions and counter party credit quality? Then give them the allowances at the commencement of the program. Want to discourage such transactions? Then offer auctions which cannot hope to mimic the diversity of many-seller many-buyer market associated with an auction based system.

- Want to have a market where emitting sources as well as speculators have balanced roles? Then give the sources allocations and allow the speculators to buy their way in buy purchasing allowances from such sources. Want to set up a system where speculators can gain unhealthy market power and shut out sources? Then distribute allowances using an auction where deep pocketed speculators can outbid sources with limited resources.

The free distribution of allowances can result in a substantial transfer of wealth from consumers to those entities that receive allowances. Under the EU ETS, the electric sector in the UK received free allowances and enjoyed windfall profits of £500 million in the first year of the program alone.[42] As noted above, windfall profits can be avoided by starting sources short and possibly legislating against windfall profits (i.e. allowing power generators to recover only the cost of their allowances (rather than the cost of most recently sold allowances). The Committee recommends that California avoid windfall profits, where they would occur, by limiting the free allocation of allowances. There should be no free allocation to firms under the cap that are able to pass most of their costs on to consumers. This, as a decision criteria, and makes no sense. The cost of allowances will be passed onto consumers under an auction or an allocation system. The only difference being that under an auction system, sources will need to buy more allowances, will incur more costs, and will pass on such costs to the consumer from day 1. The aim of emissions trading is not to reduce corporate profits, but to promote the lowest cost reductions in the most expeditious fashion. The issue of 'windfall profits' is the ability of firms to raise their prices by more than the cost of allowances and to use emissions trading as an excuse – firms can do this whatever the allocation methodology. These include electric generators, other first sellers of electricity, oil refineries, and natural gas processors. LSEs that are closely regulated or municipally owned are not included, since these entities are likely to be obligated to pass the value of freely allocated allowances through to their ratepayers.

6.1.2 Use of Allowance Value

The Committee recommends that California use a portion of the allowance value generated under a cap-and-trade program to promote investment in low-GHG technologies and fuels (including energy efficiency) by providing incentives to firms and consumers. The state could do this by auctioning allowances and using the proceeds to support investment incentive programs.

Alternatively, it could tie the free allocation of allowances to commitments for climate-friendly investments. Why should the state choose winners? Why will the bureaucrats be smarter than the plant manager at finding low cost GHG reduction solutions? What guarantee do we have that the monies raised through an auction will, in fact, be spent on effective GHG reduction efforts? How will the bureaucrats be funded? More than likely through funds generated in an auction, which would mean less money spent on reducing emissions.

Specifically, the Committee recommends that California use a substantial portion of the value of allowances to promote end-use efficiency among residential, commercial, and industrial energy consumers, and to increase assistance to low-income consumers. Again, under this proposal, it is the state that determines who gets the benefit of auction generated revenues. It is the state that determines the winners and losers. Why not let the market decide which GHG reducing technologies are best? This can be accomplished by auctioning allowances and using the proceeds to support existing and new efficiency programs, or by distributing allowances for free to LSEs, natural gas distribution companies, or other entities that are well positioned to deliver efficiency services to consumers. Emissions trading is supposed to promote the most cost effective and timely solution. It is not intended to provide hidden, unregulated subsidies to some companies

[42] Such windfalls can occur if generators receive more than their share of allowances or permits (and so sell permits into the rest of the market) or if they are able to pass the opportunity cost of the permits onto ratepayers. In the latter case, ratepayers end up paying for permits which were given freely to the generator, creating windfall gains. So legislate against such practices.

and not others. Giving auction generated revenues (or free allowances) to special interests does not guarantee either results or the accomplishment of environmental goals. It only guarantees the government redistribution of wealth. And those doing the redistributing have very limited downsides if they guess wrong. Promote a solution that is 4x less cost effective than another? No worries, we'll try to get it right the next time. The state could also offset the economic impact of the program by using auction revenues to displace income taxes or other taxes that distort economic decisions. So, the state will choose winners, give them special treatment, and then redistribute the wealth collected through auctions. It's better not to collect the money in first place.

The Committee believes it is also appropriate to use a portion of the allowance value to finance reductions of GHGs in communities that bear disproportionate environmental and public-health burdens. To make an obvious point, GHG emissions have no impact at all on local pollution.

In addition, the Committee recognizes that California is already beginning to feel the impacts of global warming and supports using a portion of the allowance value to promote investments that will help the state's ecosystems and citizens adapt to these impacts.

Finally, the Committee believes it is appropriate to use a portion of allowance value to provide transition assistance aimed at mitigating the impact a pollution cap might have on workers or firms that are subject to strong market pressures from competitors located in un-capped jurisdictions ….or from competitors in capped jurisdictions that use allocations and, therefore, have lower cost structures. Instead, rather than auction, build into the allocation methodology consideration for competitive vulnerability. This is how the Phase 2 allocations have been done in Europe. Auctioning prevents firms from being able to take competitive pressures in different industry

sectors into account. Such firms are most likely to include industrial facilities with substantial GHG emissions and large industrial and commercial consumers of electricity and natural gas. We recommend that California undertake further study to determine whether any firms are likely to shut down or substantially downsize on account of competitive pressures that are directly connected to the absence of caps on global warming pollution outside of the state. We also recommend that the state evaluate whether incentives for efficiency or other clean-technology investments are sufficient to mitigate the projected economic dislocation, and if they are not, to consider direct financial assistance drawing on the allocation of allowance value. Such assistance should be linked to continued economic activity through an output-based updating system that, for example, would distribute one allowance per unit of a good or service that is manufactured. It should also be structured in a way that will not discourage or penalize investment in low-carbon technologies or fuels, including energy efficiency, and should only be provided for a temporary period of transition. …again, we have the bureaucrat determining what qualifies and what does not. Why not let the market decide which companies should get rewarded and which should be penalized? This whole system of collecting and redistributing revenues graphically illustrates that it is a carbon tax that is being advocated, not an emissions trading system like any that has been implemented before.

6.1.3 Recommendations for Allowance Distribution

As the above discussion indicates, the state can promote climate-friendly investments either by tying the free allocation of allowances to specific investments or through the distribution of auction revenues.[43] Free allocation could also mitigate the potential diversion of allowance value to purposes unrelated to climate change mitigation. However, it would not be possible to use this approach to advance some important goals, such as providing broad-based compensation through tax shifting. In addition, some committee members believe tying free allocation to specific purposes is more cumbersome and less transparent than using auction proceeds to advance program goals. Some have argued that the free distribution of allowances is preferable because it is similar to traditional regulation, under which companies are effectively allowed to emit for free up to a certain level without incurring any cost. In effect they have had a prior right to pollute. Free distribution is similar to traditional regulation in this regard only to the extent that the covered firm cannot pass allowance costs onto others. For such firms, allowances allocated freely communicate both allowable emissions and required reductions. The amount given for free determines the balance.

On balance, the Committee finds most compelling the arguments for a mixed approach in which auctioning is increased over time. California can achieve any policy objective that free distribution might deliver through the targeted use of auction proceeds, or other policies. As discussed above, this is not true. Auctions cannot hope to achieve the results that come with allocations such as over compliance which is a condition precedent before sources sell allowances. The key advantages of auctioning over allocation are: (1) auctioning more effectively avoids windfall profits and perverse incentives; Not so. Windfalls can be eliminated through legislation governing the type of profits a participating source can realize. Further, auctioning results in a perverse incentive….minimize your need to buy and reduce costs rather than figure out how to use less in order to make money by selling allowances.

[43] A third alternative is to distribute allowances to a trustee or fund manager who would auction allowances and use the proceeds to make investments according to specific criteria or otherwise distribute funds as directed by the State. While technically this is a free distribution to a third party, we consider it to be identical to an auction in effect and do not discuss it separately.

(2) auction revenues can be used more directly and more transparently to advance program goals; The program goals are to promote cost effective and expeditious GHG reductions, not create a pot of money that can be given away in accord with the wishes of well meaning but ultimately unaccountable bureaucrats. (3) auctioning treats new entrants and existing emitters on a level playing field; This is not true. Existing emitters have sunk costs and stranded assets. New entrants have the choice of tailoring their purchases and facility designs in perfect synchronization. Existing polluters have operations designed for an environment where polluting is free, and new entrants design their plant for the new environment, so auction discriminates against existing polluters who have a higher cost-base. It is not credible to state that auctioning treats stranded asset existing sources the same as new sources. and (4) auctioning avoids the challenges of designing a fair free distribution. On the contrary, auctioning unfairly forces existing facilities with stranded assets to purchase a base level of allowances and pits them against both each other as well as well financed non-facility players for each and every allowances. As to simplicity, using a system that first starts by figuring each facility's proportional share of existing emissions, then divides the initial cap up amongst such sources according to those fractions can be simpler than trying to design and implement auctions that not only mimic a free market but go one better by ensuring that the "proper" outcome results. In point of fact, auctions are easier for civil servants (no hard upfront decisions), and free distribution is easier for politicians (can be seen to be championing local industry by lobbying for allocation concessions) – so in the end, what you get probably depends on which part of government is really in charge. However, some committee members believe that the government is more likely to be effective at distributing allowances directly for purposes supportive of climate change mitigation and transition assistance than it would be at selling the allowances and distributing the revenue. If converted to cash through an auction, the value of allowances could more easily be used for purposes unrelated to the goals of the program. In point of fact, auctions will kill green investments. How? Auctions transfer scarce capital away from the industries that pollute (and therefore have the greatest opportunities to reduce) and give these monies to the government, to pass on in an inefficient manner to technology developers that don't emit (and therefore have only a secondary opportunity to promote reductions) or the general taxpayer.

The Committee also acknowledges concern regarding the lack of familiarity with auctions, especially in a regulatory context.[44] There is no experience with a 100 percent auction of allowances in previous emission trading programs. There is a precedent for smaller auctions in various NOx, SO_2 and CO_2 markets; in addition, the Northeast states' RGGI program is requiring participating states to effectively auction at least 25 percent of allowances. RGGI states have hope, not experience in auctions. At the time of this writing, five RGGI states have announced their intent to auction 100 percent of their allowances. Planning is already underway in New York for starting auctions in 2008 prior to program implementation in 2009. More generally, there is ample precedent for the government to begin charging for something that previously it gave a way for free, for example in the sale of timber, oil-tract leases, and the radio spectrum auction.[45] The existence of experience does not justify the use of this approach. Also, none of these examples include industries that are either basic necessities (like electricity) or have large amounts of sunk capital. And although the CO_2 auction would be large on an annual basis, it is not especially large compared to treasury-bill auctions, which have many more elements of complexity. However, complexity lies not only in designing or running the auction but also in the ability of sources to effectively participate. This consideration favors a period of learning-by-doing by adopting a phased approach. Learning the hard way? What is Plan B if auctioning doesn't work? Why change an approach that has proven to be effective?

Another concern is the impact an auction might have on cash flow of regulated firms. Firms may face challenges in budgeting and financing, especially at the beginning of the program. It is possible that large auction expenditures by firms may slow down investment because of capital-market constraints. Yes it does.[46] However, it seems unlikely that many highly profitable investments would be foregone because of difficulty raising funds for them.[47] The implication here is that all businesses in CA are highly profitable and, therefore, such firms will have no problems buying allowances. This is a false assumption. A good number of affected firms are not highly profitable. In fact, all firms in CA have scare resources. Further, such firms will be faced with the need to buy not just one year's worth of allowances, but thirty or more. Where will the money come from? All of sudden, what may have been highly profitable firms may emerge from an auction with a thirty year supply and a very bad balance sheet. On the other hand, with free allocation the government may need to answer the question: "Why subsidize this industry or firm rather than others?" The very same question that will need to be answered when auction derived revenues must be redistributed. Meanwhile, as we have already noted, the influx of revenue to the government poses many opportunities to complement the program and achieve related goals, although doing so effectively and avoiding negative outcomes will require transparency and oversight. Another layer of bureaucracy. All these ideas add to the cost of the program, and therefore lessen the benefit to the environment.

Some observers have suggested that CARB may not have the authority to auction and that auctioning might require further legislative action. If this is the case the agency could consider a number of alternatives to implement a design that would resemble an auction, including allocation to a public trustee, LSEs, or local distribution companies who could auction allowances on behalf of the state's citizens, or direct allocation to households. Why make this any more complicated than it needs to be? Also, financial credit issues would be a huge barrier to trading.

One thing that is not mentioned in this discussion is the effect an auction regime may have on the reliability of the electric system. This issue is a political hot button in CA after the rolling blackouts of 2000 and 2001. Generators that cannot obtain allowances in an auction will not have a cost base for pricing their electricity. Because an auction system is untried, sources may take several years before they are comfortable trading in a secondary spot market, so price discovery may be limited to auction results. If a generator cannot effectively price its costs, it may be forced to curtail, which could affect the reliability of the grid. This problem is eliminated with free allocations.

[44] A voluminous literature has grown over three decades about the performance of auctions in theory and practice. One increasingly useful approach in auction design is "test bedding" of a design using experimental methods. See Holt et al. (2007) for a recent review.

[45] For example the U.S. Federal Communications Commission eventually turned away from what has been called a "beauty contest" process for allocating the radio spectrum for phone licenses to the use of an auction in 1994. This approach worked well and raised about $20 billion in the initial series of auctions (McAfee and McMillan, 1996) The subsequent UK radio spectrum auction raised about $34 billion and has been termed the "largest auction ever" (Binmore and Klemperer 2002).

[46] Upfront payments for allowances might raise the firms' cost of capital, and there are many examples where capital structure matters for firm efficiency (Wruck, 1994).

[47] Ideas we suggest for using allowance value to incentivize and support new investments also would help overcome any potential barriers.